BULLETIN OF MARINE SCIENCE, 34(1): 135–140, 1984 CORAL REEF PAPER

BIOLOGICAL RESULTS OF THE UNIVERSITY OF MIAMI
DEEP SEA EXPEDITIONS

CLADOCARPOIDES YUCATANICUS, A NEW GENUS AND SPECIES OF AGLAOPHENIINAE (COELENTERATA: HYDROIDA: PLUMULARIIDAE) FROM ARROWSMITH BANK, YUCATAN CHANNEL

Mary Anna Bogle

ABSTRACT

Due to the unique character of its gonosome, a new genus and species of hydroid, *Cladocarpoides yucatanicus* (family Plumulariidae), is described and illustrated from material collected by the R/V GERDA and R/V JOHN ELLIOTT PILLSBURY from the Yucatan Channel. It is compared with closely allied species of the genus *Cladocarpus*.

Several specimens of a large, strikingly handsome hydroid collected from Arrowsmith Bank in the Yucatan Channel on three separate cruises, May and September, 1967 and August 1970, on the University of Miami's research vessels GERDA and JOHN ELLIOTT PILLSBURY represent a new genus and species belonging to the family Plumulariidae (subfamily Aglaopheniinae Stechow, 1911). The genus is here designated *Cladocarpoides*, having strong trophosomal similarities with several members of the genus *Cladocarpus* but with such basic differences in the gonosome that the establishment of a new genus is warranted. A preliminary unpublished account of the genus appeared in my Master's thesis.[1]

Type material of the type species for the genus is deposited in the collections of the National Museum of Natural History, Smithsonian Institution (USNM) and the invertebrate museum of the Rosenstiel School of Marine and Atmospheric Science (RSMAS), University of Miami.

Cladocarpoides new genus

Diagnosis.—Aglaopheniinae with gonangia borne on the rachis of a corbula-like structure arising singly from the proximal internode of unmodified primary hydrocladia (those arising as branchlets of the hydrocaulus); corbula-like structure composed of a central rachis, modified hydrocladia, and nematophorous branchlets. Modified hydrocladia, each having a single hydrotheca and ending in a nematophorous spike, arising pinnately, alternately from this rachis. Gonangia protected and enclosed by nematophorous branchlets arising from the modified hydrocladia and arching medially over the front of the rachis.

Description.—Gonangia are protected by open corbula-like structures each composed of a long rachis of pinnately arranged and modified hydrocladia borne by the apophyses of the rachis, and of nematophorous branchlets (phylactogonia) arising singly from the promixal internode of each modified hydrocladium.

The long rachis arises from an area lateral to and just above the mesial nematotheca of the proximal internode of certain otherwise unmodified hydrocladia. From this rachis numerous highly modified hydrocladia, each bearing a single

---

[1] A Review and Preliminary Revision of the Aglaopheniinae (Hydroida: Plumulariidae) of the Tropical Western Atlantic. M.S. Thesis. 307 pp. Unpublished.

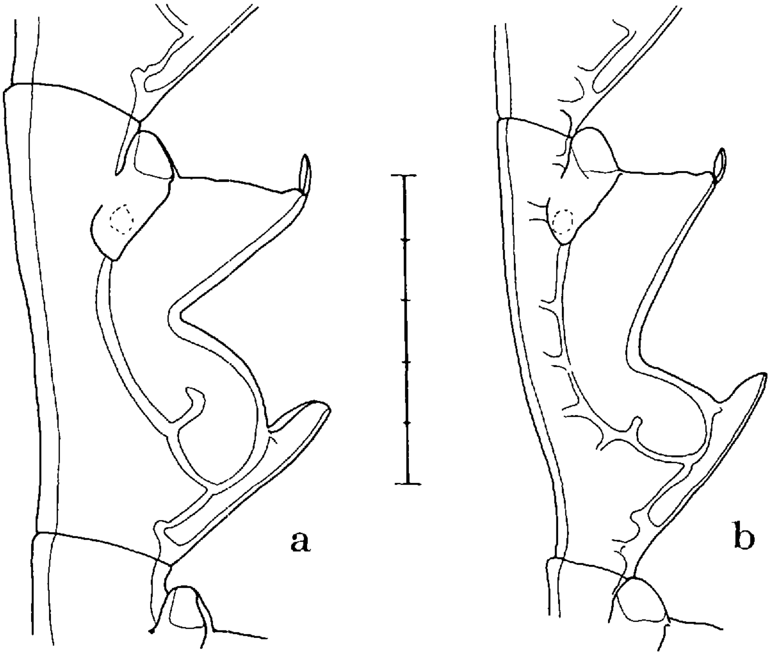

Figure 1. *Cladocarpoides yucatanicus,* new species: a, Hydrotheca of holotype, lateral view, USNM 60210 (Arrowsmith Bank), scale 0.5 mm; b, Hydrotheca of paratype, lateral view, USNM 60211 (Arrowsmith Bank), scale 0.5 mm.

hydrotheca and its accompanying nematothecae and terminating in a spike, arise pinnately, alternately. A single phylactogonium originates from an area lateral to and slightly above the mesial nematotheca of each modified hydrocladium. These phylactogonia arch medially over the front of the rachis thus protecting the gonangia borne along the longitudinal axis of the rachis near the base of the apophyses.

Trophosome shows similarities to that of several tropical western Atlantic species of *Cladocarpus,* including *Cladocarpus tenuis* Clarke, 1879 and *C. dolichotheca* Allman, 1877.

Type-Species.—*Cladocarpoides yucatanicus,* new species (by monotypy).

Etymology.—From *Cladocarpus* Allman, 1874, and Greek *-oides* (like, resembling).

Discussion.—The ultimate protective branchlets or phylactogonia of the gonosome of *Cladocarpoides* bear a striking resemblance to the antler-like phylactogonia of several tropical western Atlantic species of *Cladocarpus.* However, instead of the phylactogonia arising individually and directly from the proximal internode of primary hydrocladia as in the genus *Cladocarpus,* the phylactogonia of *Cladocarpoides* are the ultimate appendages to a long rachis which has arisen from the proximal internode of primary hydrocladia. This rachis is structurally and functionally similar to the hydrocaulus of the colony with highly modified hydrocladia arising pinnately, alternately from each indistinct node of the rachis. As in *Cladocarpus,* the phylactogonia originate singly near each mesial nematotheca of the single hydrotheca on these modified hydrocladia.

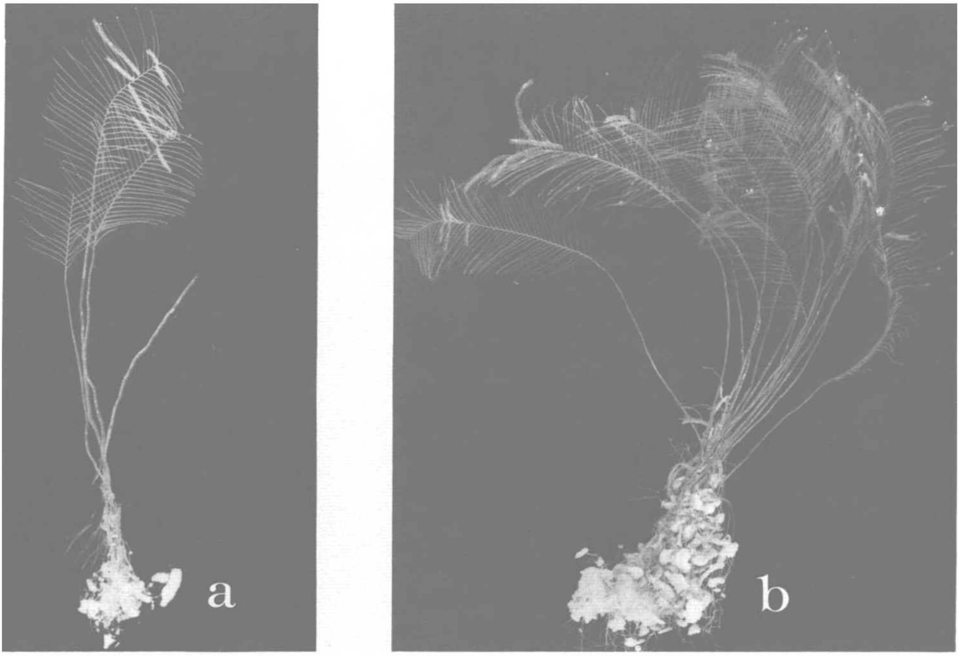

Figure 2. *Cladocarpoides yucatanicus*, new species: a, Paratype, UMML 5:156 (Arrowsmith Bank), height 11.0 cm–14.0 cm; b, Holotype, USNM 60210 (Arrowsmith Bank), height 10.0 cm–15.0 cm.

Cladocarpoides yucatanicus new species

Figures 1–3

Material Examined.—Material in the USNM: Holotype, USNM 60210, cluster of 15 hydrocauli, G-899, Arrowsmith Bank (20°57'N, 86°34'W), 40–165 m, 10 September 1967. Hydrocauli 10 to 15 cm high. Gonosome present on 12 of the 15.—Paratype, USNM 60211, cluster of five hydrocauli (all of which are broken basally), P-581, Arrowsmith Bank (21°05'N, 86°23'W), 146–265 m, 22 May 1967. Gonosome present.

MATERIAL AT RSMAS: Paratypes, UMML 5:152, two clusters with two and three hydrocauli respectively, G-889, Arrowsmith Bank (20°55'N, 86°28'W), 178–220 m, 10 September 1967. Hydrocauli 10 to 14 cm high. Gonosome present.—UMML 5:153, cluster of four hydrocauli one of which is broken, G-893, Arrowsmith Bank (21°10'N, 86°21'W), 242–320 m, 10 September 1967. Hydrocauli 14 to 16 cm high. No gonosome present.—UMML 5:154, cluster of five complete hydrocauli and one broken hydrocaulus, G-898, Arrowsmith Bank (21°04'N, 86°19'W), 339–366 m, 10 September 1967. Hydrocauli 8 to 11 cm high. Gonosome present on one.—UMML 5:156, cluster of three complete hydrocauli and a broken hydrocaulus, G-1276, Arrowsmith Bank (21°02'N, 86°28.5'W), 141–220 m, 21 August 1970. Hydrocauli 11 to 14 cm high. Gonosome present.

Description.—Trophosome: Cluster of unbranched hydrocauli arising from a communal mass of hydrorhizal fibers; hydrocauli attaining heights of up to 16 cm. Each hydrocaulus slender, nonfascicled; carrying alternate hydrocladia only along the distal half. Longitudinal row of paired, fused nematothecae (or what appears to be a single nematotheca partitioned into two by a longitudinal septum) borne along the anterior face of the basal half of the hydrocaulus. Hydrocauline nodes indistinct. One to five very pronounced, oblique constrictions just proximal to the first hydrocladium with a partitioned nematotheca present between successive constrictions. Distal portion of hydrocaulus with alternate apophyses, each bearing

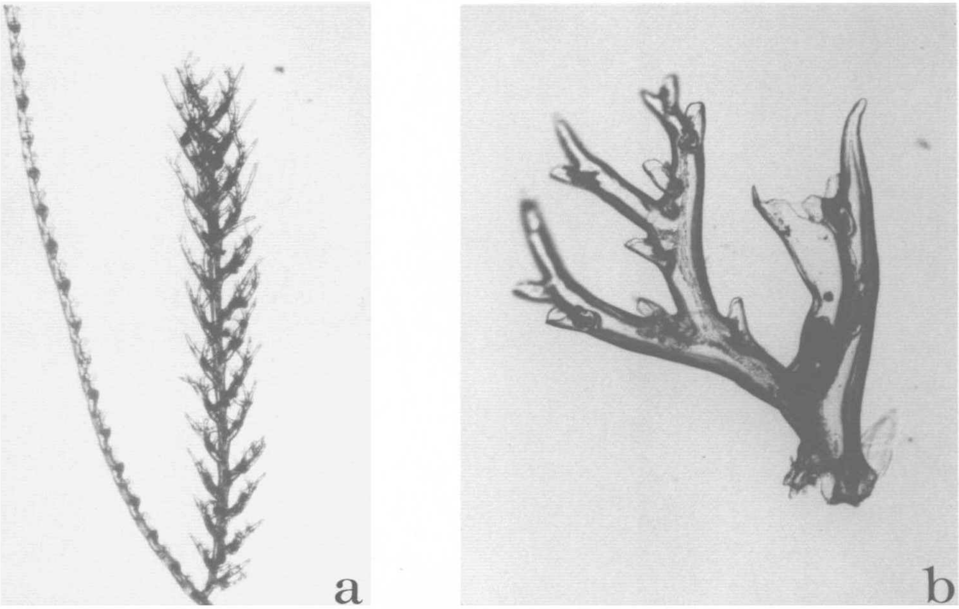

Figure 3. *Cladocarpoides yucatanicus*, new species: a, Hydrocladium from holotype with attached gonosome, USNM 60210 (Arrowsmith Bank), gonosome 9.5 mm in length; b, Individual modified hydrocladium and phylactogonium from holotype gonosome, USNM 60210 (Arrowsmith Bank), height 1.4 mm.

a single hydrocladium. Three cauline nematothecae normally associated with each apophysis: two tubular nematothecae flanking the front and back of the apophysis and a single, occasionally partitioned nematotheca proximal to the apophysis. On hydrocauli with more distantly spaced hydrocaldia than usual, the number of caluine nematothecae associated with each apophysis often more than three. What appears to be a small mamelon present on the frontal aspect of each apophysis.

Hydrocladia not closely approximated; slender, slightly sinuous and long, attaining lengths of up to 40 mm in a few specimens but usually between 20 to 30 mm in length. Hydrocladia divided into internodes by well-marked, transverse nodes. Each hydrocladial internode bearing a single hydrotheca, a pair of supracalycine nematothecae and a mesial nematotheca.

Hydrotheca relatively large and deep with strongly, sigmoidally curved anterior (abcauline) face created by the strong flexure of the hydrotheca. Adcauline wall of hydrotheca distinctly convex and adnate to the hydrocladium along the entire hydrothecal length. Hydrothecal margin sinuous except for a single, large, medial tooth and two low teeth flanking the medial tooth. A short posterior (adcauline) intrathecal ridge projecting into the lower one-third of the hydrothecal cavity. Terminal end of ridge often curved upward. Number of internodal septa opposite hydrotheca variable from zero to four short septa. Holotype material usually without septa opposite the hydrotheca but sometimes with one septum; occasionally thickenings of the adcauline wall suggesting additional septa present. Paratype from P-581 with additional septa opposite many, though not all, hydrothecae. No other septa regularly present per internode except one at the base of the mesial nematotheca.

Mesial nematotheca tubular and long, with the exception of the proximal mesial nematotheca which may be quite short. Each mesial nematotheca springing from the hydrocladium well below a hydrotheca, adnate to the hydrocladium and usually, though not always, to the basal part of the hydrotheca except for its free, scoop-like, terminal end. Aperture of the mesial nematotheca large and oval, extending from the rounded, terminal end of the mesial nematotheca to the face of the hydrotheca. Cavity of the mesial nematotheca communicating with the hydrocladial cavity through a circular orifice near the base of the mesial nematotheca.

Supracalycine nematothecae long, tubular, slightly geniculate, overtopping the hydrothecal margin. Aperture of the supracalycine nematothecae extending from the rounded apex of the nematothecae to the hydrothecal margin.

Colony golden brown in color; anchored in the substrate by a mass of hydrorhizal fibers.

GONOSOME: Gonangia protected by corbula-like structures springing from an area lateral to and above the mesial nematotheca of the proximal internode of certain otherwise unmodified hydrocladia. Each structure composed of a long, central rachis, highly modified hydrocladia borne by the apophyses of the rachis, and antler-like phylactogonia which arise singly from the proximal internode of the modified hydrocladia. Rachis with what appears to be two small nematothecae, one on the distal and one on the proximal side of each apophysis; nodes indistinct. Modified hydrocladia pinnately, alternately arranged with as many as 60 per rachis. Each modified hydrocladium bearing a single hydrotheca with its accompanying nematothecae and terminating in a long nematophorous spike. A peculiar long, tubular nematotheca present approximately halfway up the adcauline surface of the hydrotheca and directed distally. Phylactogonium (resembling those of *Cladocarpus tenuis* Clarke, 1879 and *Cladocarpus dolichotheca* Allman, 1877) originating lateral to and just above the mesial hydrothecal nematotheca of each modified hydrocladium, situated alternately on left and right hydrocladia and arching medially over the front of the rachis, thus protecting the gonangia; each composed of usually three to five nematophorous branchlets formed by the bifurcation of alternate branchlets, thus resembling stag antlers; occasionally unbranched and spike-like. Phylactogonial nematothecae long and tubular, directed upward and outward from the gonangia.

Gonathecae lengthened, obovate sacs arising from near the base of the apophyses of the rachis. Gonothecae with an oval, latero-terminal aperture.

HOLOTYPE (USNM 60210)

Measurements (in micrometers)	Range (Mean)	Number**
Hydrocladial internode, length	630–812 (697)	50
diameter at node	148–220 (188)	50
Hydrotheca, total depth	424–566 (490)	30
diameter at margin	242–280 (261)	30
Mesial nematotheca, total length*	308–407 (367)	30
length of free part*	94–132 (113)	30
Supracalycine nematotheca, total length	192–242 (212)	30
length projecting above hydrothecal margin	66–99 (83)	26
Gonotheca, total length	666–688 (679)	4
maximum width	280–314 (297)	4

---

* Excluding mesial nematotheca of the proximal hydrocladial internode.

** Number of measurements made.

Type.—Cluster of 15 hydrocauli from G-899 deposited as the holotype in the National Museum of Natural History, Smithsonian Institution, and catalogued as UNSM 60210.

Type-Locality.—G-899, Arrowsmith Bank, Yucatan Channel (20°57′N, 86°34′W), 40–165 m.

Etymology.—Alluding to the Yucatan Channel, from which the GERDA and PILLSBURY material of this new species was collected.

Locality Records.—(See *Material Examined.*)

Geographic Range.—*Cladocarpoides yucatanicus* is known only from Arrowsmith Bank in the Yucatan Channel.

Discussion.—The gonosome of *Cladocarpoides yucatanicus* bears a striking similarity to that of *Cladocarpus dolichotheca* and *Cladocarpus tenuis.* In both these species of *Cladocarpus,* the distalmost section of the unbranched colony is modified with accessory structures into a corbula-like structure very much like that of *Cladocarpoides yucatanicus* including the modified hydrocladia and antler-like phylactogonia. However, as mentioned in the previous discussion of the genus, the site of origin of the gonosome differs. In *Cladocarpus tenuis* and *C. dolichotheca,* the rachis of the corbula-like structure is the distal portion of the hydrocaulus of the colony and the phylactogonia arise from the primary hydrocladia; in *Cladocarpoides yucatanicus,* the rachis of the corbula arises as an appendage to primary hydrocladia with the phylactogonia arising from the highly modified hydrocladia that spring from this rachis. The origin of the rachis also distinguishes the genus *Cladocarpoides* from the genus *Thecocarpus* Nutting, 1900. In *Thecocarpus,* the rachis of the corbula is a continuation of a primary hydrocladium rather than an offshoot of a primary hydrocladium.

ACKNOWLEDGMENTS

This paper is a result of research undertaken while at the Rosenstiel School of Marine and Atmospheric Science, University of Miami, and is part of a series resulting from the National Geographic Society–University of Miami Deep-Sea Biology Program.

I wish to thank Dr. G. L. Voss and Dr. S. D. Cairns for their assistance in the transfer and deposition of type material from RSMAS into the collections of the USNM. My deep appreciation is also extended to Drs. F. M. Bayer and L. P. Thomas for valuable advice concerning taxonomic problems, and to Drs. D. M. Opresko and R. B. McLean of Oak Ridge National Laboratory for reviewing the manuscript. Oak Ridge National Laboratory is operated by Union Carbide Corporation under contract W-7405-eng-26 with the U.S. Department of Energy. Publication No. 1980, Environmental Sciences Division, Oak Ridge National Laboratory.

LITERATURE CITED

Allman, G. J. 1874. Report on the Hydroida collected during the expedition of H. M. S. 'Porcupine.' Trans. Zool. Soc. Lond. 8: 469–481, pls. 65–68.

———. 1877. Report on the Hydroida collected during the exploration of the Gulf Stream by L. F. de Pourtalès. Mem. Mus. Comp. Zool. Harv. 5(2): 1–66, pls. 1–34.

Clarke, S. F. 1879. Report on the dredging operations of the U.S. coast survey steamer "Blake." III. Report on Hydroida. Bull. Mus. comp. Zool. Harv. 5: 239–252, pls. 1–5.

Nutting, C. 1900. American hydroids. Part I. The Plumularidae. Spec. Bull. U.S. Natn. Mus. 4(1): 1–285, pls. 1–34.

Stechow, E. 1911. Ueber Hydroiden der Deutschen Tiefsee-Expedition. Ein neues Genus thecater Hydroiden. Zool. Anz. 37: 193–197, fig. 1.

DATE ACCEPTED: September 9, 1982.

ADDRESS: *Oak Ridge National Laboratory, Environmental Sciences Division, P.O. Box X, Oak Ridge, Tennessee 37830.*